



Enhancing Academic Success: A Novel Approach to Predict Learning Performance with an Advanced Blended Learning Performance Predictor

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Citation: Veena M. (2024), Enhancing Academic Success: A Novel Approach to Predict Learning Performance with an Advanced Blended Learning Performance Predictor, *Educational Administration: Theory and Practice*, 30(6), 1755-1767, Doi: 10.53555/kuey.v30i6.5583

ARTICLE INFO ABSTRACT

The concept of educational data mining focuses on the development of methods for investigating and analyzing the enormous amounts of information that are produced by the academic environment. It is in a position to capitalize on the large number of studies produced by the data mining industry and connect that knowledge to academic issues pertaining to teaching, reasoning, and evaluation. Recently, this sector has become predominantly effective at solving various difficulties with scholastic analytics. This achievement can be attributed to the vast processing capacity and information retrieval methods that are used. The primary goal of educational establishments at the university level is to furnish the students who attend those institutes with a curriculum of sufficient calibre. The pursuit of information that can accurately anticipate students' performance is one strategy for elevating the standard of the educational structure at the postsecondary level to the greatest possible standard. In this study, a superior Blended Learning Performance Predictor Toolkit (BLPPT) is presented that can be used to predict how students would perform on their semester examinations utilizing the data collected through surveys. The BLPPT model reaches an MAE score of 2.94×10^{11} and an MSE value of 9.18×10^{23} .

Keywords: Regression, Performance prediction, Semester result forecast, Voting based regression

INTRODUCTION

The internet's capacity to store and provide access to data and statistics is growing exponentially, making conventional information management methods obsolete. Further, the right management of globally accessible data can unlock previously unimaginable opportunities in commerce, science, and the classroom [1]. The challenge, though, is figuring out how to make the most of this information without becoming overwhelmed by the volume of numbers itself. The vast field of analytics, also known as Big data, holds the key. Several businesses and academic institutions already use machine learning as part of their operations and initiatives, but this discipline is by no means limited to those with deep pockets [2]. An emerging field, Academic Data Analysis seeks to help explain both learners and the academic environments in which they operate by establishing tools for understanding the distinctive forms of data generated in academic contexts [3]. The goal of data mining is to discover intriguing, latent, largely undiscovered, and potentially beneficial patterns or information in large datasets [4]. Since academic databases typically contain a great deal of information, several data mining techniques have been created and applied to extract the information needed and reveal any hidden relationships [5]. Regression, outlier detection, and prediction are just a few of the many common data mining tasks used in the classroom. Data mining has many potential applications in the field of education, including the prediction of dropout rates, the identification of correlations between pupils' standardized test scores and their subsequent achievement in college, the forecasting of students' grades, the identification of closely relevant threads in curriculum content, the development of new knowledge about students' academic credentials, the categorization of students' training course results by cognitive strategies, and the investment of similarities and differences between data sets [6-8].

When it comes to making accurate predictions, the forecasters in use are crucial. So, before attempting to forecast student outcomes, it is necessary to identify the components affecting the teaching & learning

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